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EXAMINER	
ODOM, CURTIS B	
ART UNIT	**PAPER NUMBER**
2611	

Law Offices of Boris G. Tankhilevich
Suite A
536 N. Civic Drive
Walnut Creek, CA 94597

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/734,415	ISAKSEN ET AL.	
	Examiner	Art Unit	
	Curtis B. Odom	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) *26-29 and 36-40* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25 and 30-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 September 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1-25 and 30-35 are objected to because of the following informalities:

a. Regarding claims 1-25 and 30-35, "QAM" is suggested to be changed to "Quadrature Amplitude Modulation (QAM)".

b. Regarding claims 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, and 24, the claims include limitations such as "causing said state machine to enter state 1A" and "causing said state machine to enter state 1B". However, the claims do not define a method/procedure or what is incorporated into each state. It is suggested the claims define each state.

c. In claims 1-25, it is suggested the step references (A, B, A1, B1) be deleted. For example, in claim 4 step "A2" should be step "A1" since it corresponds directly to step "A". If claim 4 were to depend upon claim 2 or claim 3, then the step should be labeled "A2".

d. Regarding claims 1 and 32, the phrase "said received QAM constellation" is suggested to be changed to "a received QAM constellation".

e. Regarding step C of claim 1, the phrase "said equalizer" is suggested to be changed to "an equalizer".

f. Regarding claim 5, the phrase "said QAM signal frequency drift" is suggested to be changed to "a QAM signal frequency drift".

g. Regarding claim 5, "etc." is suggested to be deleted.

h. Regarding claim 7, the phrase “symbol timing recovery loop readjusting” is suggested to be changed to “symbol timing recovery loop, and readjusting”.

i. Regarding claim 9, the phrases “said set of frequency coefficients” and “said set of phase coefficients” is suggested to be changed to “a set of frequency coefficients” and “a set of phase coefficients”.

j. Regarding claim 13, the phrases “said set of frequency coefficients” and “said set of phase coefficients” is suggested to be changed to “a set of frequency coefficients” and “a set of phase coefficients”.

k. Regarding claim 15, the phrase “said carrier recovery loop” is suggested to be changed to “said carrier loop”.

l. Regarding claim 17, the phrases “said set of frequency coefficients” and “said set of phase coefficients” is suggested to be changed to “a set of frequency coefficients” and “a set of phase coefficients”.

m. Regarding claim 21, the phrase “re-adjusting said step size coefficient...to optimize said error feedback” is suggested to be changed to”re-adjusting a step size coefficient...to optimize an error feedback”.

n. Regarding claim 23, the phrase “said step size coefficient” is suggested to be changed to “a step size coeffiecient”.

o. Regarding claim 30, the phrases “said input QAM signal”, “said received QAM signal”, and “said acquired QAM signal” are suggested to be changed to “an input QAM signal”, “a received QAM signal”, and “an acquired QAM signal”.

p. Regarding claim 31, the phrase "said symbol timing recovery loop" is suggested to be changed to "a symbol timing recovery loop".

q. Regarding claim 34, the phrase "said equalizer" is suggested to be changed to "an equalizer".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 30-35 are rejected under 35 U.S.C. 102(b) as being anticipated by de Lantremange (U. S. Patent No. 6, 115, 433).

Regarding claim 30, de Lantremange discloses an apparatus (Fig. 1A and 1B) for automated acquisition of a QAM signal column 1, lines 13-17 and column 6, lines 6-15, wherein reception is acquisition), the apparatus employing a state machine (Fig. 1A, Table 2, column 25, lines 21-46) progressing from an initial state (STATE 0) to a final state (STATE 6); the apparatus comprising:

Fig. 1A, block 28, column 7, lines 33-46 which corresponds to a means for performing an automatic gain control (AGC) operation on the incoming QAM signal to maintain a steady amplitude (wherein magnitude is equivalent to amplitude) of the QAM signal;

Fig. 1A, blocks 24, 26, 32, 34, and 36, column 17, lines 11-17 disclose a timing recover loop for adjusting timing of a sampling clock (wherein compensating for offsets of the sampling clock allows timing recovery as disclosed in column 12, lines 31-41) which corresponds to a means for performing a symbol timing recovery of the input QAM signal;

Fig. 1A, block 32, column 8, lines 35-67 discloses a self- recovering adaptive feed-forward filter using a blind algorithm corresponding to a means for performing a Blind Equalization (wherein the blind algorithm used to update coefficients corresponds to a blind equalization operation) of the QAM signal without carrier lock (wherein there is no disclosure of locking the carrier) to minimize a dispersion error (see column 10, lines 1-14) of the received QAM signal constellation as compared with an error-free QAM signal constellation (wherein the dispersion error is minimized to match output of the modulator shaping filter (error-free signal constellation) with output of the adaptive filter as described in column 1, lines 58-67);

Fig. 1B, column 19, line 54-column 20, line 27 discloses compensating for phase and timing (frequency) offsets of the carrier to recover the carrier which corresponds to a means for performing a carrier recovery of the QAM signal to eliminate a residual carrier frequency error and to eliminate a phase error (see column 19, lines 54-64) from the acquired QAM signal; and

column 9, lines 1-14 and column 11, lines 56-67 discloses minimizing residual error (distortion) in the QAM signal using a DDE algorithm which corresponds to a means for performing a decision directed equalization (DDE) of the QAM signal.

Regarding claim 31, de Lantremange discloses the means for performing the symbol timing recovery of the input QAM signal further includes: a means for adjusting a sampling clock of the symbol timing recovery loop (column 17, lines 11-17).

Regarding claim 32, de Lantremange discloses the means for performing the Blind Equalization of the QAM signal without carrier lock further includes: a means for minimizing a dispersion error of the received QAM signal constellation as compared with an error-free QAM signal constellation (Fig. 1A, block 32, see column 10, lines 1-14, wherein the dispersion error is minimized using the Multiple Constellation Partition Algorithm to match output of the modulator shaping filter (error-free signal constellation) with output of the adaptive filter as described in column 1, lines 58-67);

Regarding claim 33, de Lantremange discloses the means for minimizing the dispersion error of the received QAM signal constellation as compared with the error-free QAM signal constellation further includes: a means for adjusting a set of coefficients of an equalizer (see column 10, lines 1-20, wherein Equation 6 updates coefficients to minimize dispersion as disclosed in column 10, lines 1-20).

Regarding claim 34, de Lantermange discloses the means for performing the decision directed equalization (DDE) of the QAM signal further includes: a means for updating a set of coefficients of the equalizer (see column 11, lines 56-column 12, line 5, wherein LMS is a decision directed algorithm which uses Equation 10 to also update coefficients in the same manner as Equation 6).

Regarding claim 35, de Lantermange discloses the means for performing the decision directed equalization (DDE) of the QAM signal further includes: a DDE algorithm (see column 9, lines 1-14).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 4-8, 10, 12, 14, 16, 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Lantremange (U. S. Patent No. 6, 115, 433) in view of Zhu et al. (US 2004/0005022).

Regarding claim 1, de Lantremenge discloses a method of automated acquisition of a QAM signal (column 1, lines 13-17 and column 6, lines 6-15, wherein reception is acquisition), the method employing a state machine (Fig. 1A, Table 2, column 25, lines 21-46) progressing from an initial state (STATE 0) to a final state (STATE 6); the state machine comprising: Fig. 1A, blocks 24, 26, 32, 34, and 36, which correspond to a symbol timing recovery loop (see column 17, lines 11-17, wherein adjusting the sampling clock of the resampler provides timing recovery) ; Fig. 1B which corresponds to a carrier loop; and Fig. 1A, block 32, which corresponds to an equalizer (see column 8, lines 35-44); the method comprising the steps of:

(Fig. 1A, block 28, column 7, lines 33-46) performing an automatic gain control (AGC) operation on the incoming QAM signal to maintain a steady amplitude (wherein amplitude corresponds to magnitude) of the QAM signal;

(Fig. 1A, blocks 24, 26, 32, 34, and 36, column 17, lines 11-17) performing a symbol timing recovery of the input QAM signal by adjusting a sampling clock (see column 17, lines 11-17) of the symbol timing recovery loop;

(Fig. 1A, block 32, column 8, lines 35-67) performing a Blind Equalization (see column 8, lines 61-67) of the QAM signal without carrier lock (wherein carrier lock is performed after the equalization in Fig. 1B) to minimize a dispersion error (see column 10, lines 1-15) of the received QAM signal constellation as compared with an error-free QAM signal constellation by adjusting a set of coefficients of the equalizer (wherein the dispersion error is reduced using the Multiple Constellation Partitions algorithm which updates (adjusts) the coefficients to minimize the dispersion error);

(Fig. 1B, column 19, line 54-column 20, line 27) performing a carrier recovery of the QAM signal to eliminate a residual carrier frequency error and to eliminate a phase error from the acquired QAM signal (wherein compensating for phase and timing offsets of the carrier allows carrier recovery); and

(column 9, lines 1-14 and column 11, lines 56-67) performing a decision directed equalization (DDE) of the QAM signal by updating a set of coefficients (see Equation 10 which discloses a coefficient update algorithm similar to Equation 6) of the equalizer by using a decision based algorithm.

De Lantremenge does not disclose the state machine includes a coarse frequency loop.

However, Zhu et al. discloses a coarse frequency loop (Fig. 4, blocks 1, 12, 18, 19, 24-26, and 31) which provides a coarse frequency estimate of a received signal (sections 0134-0136). The coarse frequency estimate is used to adjust the frequency of a received signal through Fig. 4,

block 25 (see section 0142 and 0148) to compensate for a frequency offset. Therefore, it would have been obvious to one skilled in the art at the time invention was made to modify the method/device of Maltsev et al. with the coarse frequency loop of Zhu et al. to compensate for frequency offsets (section 0148) which could cause interchannel interference in the received signal (Zhu et al., section 0128).

Regarding claim 2, de Lantermenge further discloses performing the automatic gain control (AGC) operation on the incoming QAM signal further includes the step of: causing the state machine to enter state 1 (column 25, lines 24-25) which corresponds to state 1A of the present invention.

Regarding claim 4, de Lantermenge further discloses performing the automatic gain control (AGC) operation on the incoming QAM signal further includes the step of: causing the state machine to enter state 1 (column 25, lines 24-25) which corresponds to state 1B of the present invention).

Regarding claim 5, Zhu et al. further discloses performing a coarse frequency estimation of a signal frequency drift over a long period (sections 0134-0136, wherein the large frequency estimation range corresponds to a long period of time and the longer the estimation, the more accurate the estimation as disclosed in section 0136) of time due to aging, temperature changes, humidity changes in order to obtain a set of frequency corrections (sections 0142, wherein the final measured frequency offset is the frequency correction), and to apply the set of frequency corrections to a set of frequency offsets in the coarse frequency loop (Fig. 4, block 25, section 0148). It would have been obvious to one skilled in the art to include this coarse frequency estimation as apart of the AGC operation since to compensate for frequency offsets (section

0148) which could cause interchannel interference in the received signal (Zhu et al., section 0128).

Regarding claim 6, de Lantermenge further discloses the step of performing the symbol timing recovery of the input QAM signal further comprises the step of: causing the state machine to enter state "2" (column 25, lines 26-31), which corresponds to state 2 of the present invention.

Regarding claim 7, de Lantermenge further discloses the step of performing the symbol timing recovery of the input QAM signal while the state machine stays in the state "2" further comprises the step of: adjusting the sampling clock of the symbol timing recovery loop re-adjusting the sampling clock (Fig. 1A, block, 124, see column 17, lines 11-17) of the symbol timing recovery loop (Fig. 1A, blocks 24, 26, 32, 34, and 36) to optimize the symbol timing recovery of the input QAM signal.

Regarding claim 8, de Lantermenge further discloses the step of performing the symbol timing recovery of the input QAM signal further comprises the step of: causing the state machine to enter state "3" (column 25, lines 26-31) which corresponds to state 3 of the present invention.

Regarding claim 10, de Lantermenge further discloses the step of performing the Blind Equalization of the QAM signal without carrier lock further includes the step of: causing the state machine to enter state “2” (column 25, lines 36-31) which corresponds to state “4” of the present invention.

Regarding claim 12, de Lantremenge further discloses the step of performing the carrier recovery of the QAM signal further includes the step of: causing the state machine to enter state “2” (column 25, lines 36-51) which corresponds to state 5A of the present invention.

Regarding claim 14, de Lantremenge further discloses the step of performing the carrier recovery of the QAM signal further includes the step of: causing the state machine to enter state "2" (column 25, lines 36-51) which corresponds to state 5B of the present invention.

Regarding claim 16, de Lantremenge further discloses the step of performing the carrier recovery of the QAM signal further includes the step of: causing the state machine to enter state "2" (column 25, lines 36-51) which corresponds to state 6 of the present invention.

Regarding claim 18, de Lantremenge further discloses the step of performing the decision directed equalization (DDE) of the QAM signal further includes the step of: causing the state machine to enter state "4" (column 25, lines 36-51) which corresponds to state 7 of the present invention.

Regarding claim 19, de Lantremenge further discloses the step of performing the decision directed equalization (DDE) of the QAM signal further includes the step of: using a step size coefficient (Equation 10, wherein μ denotes a step size as shown in Table 3) in the DDE algorithm (wherein LMS is a DDE algorithm as disclosed in column 9, lines 1-14) to determine the error feedback (see column 9, lines 1-14) from the carrier loop (wherein the error estimator 52 is apart of the carrier loop of Fig. 1B) the error to the equalizer.

Regarding claim 20, de Lantremenge further discloses the step of performing the decision directed equalization (DDE) of the QAM signal further includes the step of: causing the state machine to enter state "4" (column 25, lines 36-51) which corresponds to state 8 of the present invention.

Regarding claim 21, de Lantremenge further discloses the step of performing the decision directed equalization (DDE) of the QAM signal further includes the step of: re-adjusting a step

size coefficient (Equation 10, wherein μ denotes a step size as shown in Table 3, and Equation 10 is a coefficient update algorithm similar to Equation 6) in the DDE algorithm (wherein LMS is a DDE algorithm as disclosed in column 9, lines 1-14) to optimize the error feedback (see column 9, lines 1-14) from the carrier loop (wherein the error estimator 52 is apart of the carrier loop of Fig. 1B) the error to the equalizer.

Regarding claim 22, de Lantremenge further discloses the step of performing the decision directed equalization (DDE) of the QAM signal further includes the step of: causing the state machine to enter state "4" (column 25, lines 36-51) which corresponds to state 9 of the present invention.

Regarding claim 23, de Lantremange further discloses the step of performing the decision directed equalization (DDE) of the QAM signal further includes the step of tracking the QAM signal by updating (re-adjusting) the step size coefficient in the DDE (LMS) algorithm (see Equation 10, wherein a component of the coefficient update algorithm is produce by the carrier tracking system).

Regarding claim 24, de Lantremenge further discloses cycling the state machine back to state (column 25, lines 56-59), wherein the state machine is recycled to state 0 (reset) based on an error.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over de Lantremange (U. S. Patent No. 6, 115, 433) in view of Zhu et al. (US 2004/0005022) and in further view of Mobin et al. (U. S. Patent No. 6, 249, 554).

Regarding claim 3, de Lantremange and Zhu et al. do not disclose the AGC operation of the state machine further includes computing, averaging and comparing to a target level an

output power at Nyquist filter, wherein the output power represents the average power in the QAM signal constellation, and wherein an error signal between the average power in the QAM signal constellation and the output target power level is used to maintain a steady QAM signal amplitude.

However, Mobin et al. discloses in Fig. 2, column 1, lines 53-60 and column 3, lines 22-34 computing, averaging and comparing to a reference level an output power at Nyquist filter (Fig. 1, block 105, wherein the half-rate filter corresponds to a Nyquist filter since Nyquist filters produces half rate (sampling) signals), wherein the output power represents the average power in the QAM signal constellation (column 1, lines 19-39), and wherein a difference value which corresponds to an error signal (see column 1, lines 53-60) between the average power in the QAM signal constellation and the output reference (target) power level is used to adjust the magnitude (amplitude) of the signal (column 3, lines 47-59) to maintain a steady QAM signal amplitude. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the state machine of de Lantremange and Zhu et al. with the gain control operation of Mobin et al. since de Lantremange states that gain control can maintain the magnitude of a signal at a constant level and control the dynamic range of a signal for proper equalization (column 7, lines 33-61).

7. Claims 9, 13, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Lantremange (U. S. Patent No. 6, 115, 433) in view of Zhu et al. (US 2004/0005022) and in further view of Fukuoka et al. (U. S. Patent No. 6, 421, 378).

Regarding claim 9, de Lantremange and Zhu et al. do not disclose the symbol timing operation of the state machine includes re-adjusting a set of frequency coefficients and re-adjusting a set of phase coefficients of the symbol loop to optimize the symbol timing recovery.

However, Fukuoka et al. discloses at Fig. 1, blocks 30, 41, and 42, column 3, lines 41-52 and column 6, lines 61-67 adjusting and re-adjusting (updating) a set of phase coefficients and a set of frequency coefficients in an automatic frequency/phase control loop to remove frequency and phase errors from a received QAM signal. (see Figs. 11 and 12, column 4, lines 31-34). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the state machine of de Lantremange and Zhu et al. with the frequency and phase adjustment of Fukuoka et al. since Fukuoka et al. states the frequency and phase adjustment corrects frequency and phase errors simultaneously (column 6, line 61-column 7, line 8).

Regarding claim 13, de Lantremange and Zhu et al. do not disclose the carrier recovery operation of the state machine includes adjusting a set of frequency coefficients and adjusting a set of phase coefficients of the carrier loop.

However, Fukuoka et al. discloses at Fig. 1, blocks 30, 41, and 42, column 3, lines 41-52 and column 6, lines 61-67 adjusting (updating) a set of phase coefficients and a set of frequency coefficients in an automatic frequency/phase control loop to remove frequency and phase errors from a received QAM signal to restore (recover) original carrier waves (column 1, lines 38-44). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the state machine of de Lantremange and Zhu et al. with the frequency and phase adjustment of Fukuoka et al. since Fukuoka et al. states the frequency and phase

adjustment corrects frequency and phase errors simultaneously (column 6, line 61-column 7, line 8).

Regarding claim 17, de Lantremange and Zhu et al. do not disclose the carrier recovery operation of the state machine includes re-adjusting the set of frequency coefficients and the set of phase coefficients of the carrier loop to optimize the carrier acquisition of the QAM signal.

However, Fukuoka et al. discloses at Fig. 1, blocks 30, 41, and 42, column 3, lines 41-52 and column 6, lines 61-67 adjusting (updating) a set of phase coefficients and a set of frequency coefficients in an automatic frequency/phase control loop to remove frequency and phase errors from a received QAM signal to restore (acquire) original carrier waves (column 1, lines 38-44). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the state machine of de Lantremange and Zhu et al. with the frequency and phase adjustment of Fukuoka et al. since Fukuoka et al. states the frequency and phase adjustment corrects frequency and phase errors simultaneously (column 6, line 61-column 7, line 8).

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over de Lantremange (U. S. Patent No. 6, 115, 433) in view of Zhu et al. (US 2004/0005022) and in further view of Li (U. S. Patent No. 6, 904, 087).

Regarding claim 11, de Lantremange and Zhu et al. do not disclose the blind equalization operation of the state machine includes substantially continuously performing a modulus update of the set of equalizer coefficients.

However, Li discloses at column 3, line 26-column 4, line 8 for blind equalization, using a cost function to perform a modulus update of coefficients used in an adaptive equalizer to

equalize a QAM signal constellation. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the state machine of de Lantremange and Zhu et al. with the coefficient update as taught by Li since Li states the modulus update increases the rate of convergence of the tap weights (coefficients), see column 8, lines 50-65.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over de Lantremange (U. S. Patent No. 6, 115, 433) in view of Zhu et al. (US 2004/0005022) and in further view of Schemmann et al (U. S. Patent No. 6, 904, 087).

Regarding claim 15, de Lantremange and Zhu et al. do not disclose the carrier recovery operation of the state machine includes performing a frequency sweep if a frequency offset of the QAM signal is greater than the acquisition bandwidth of the carrier recovery loop so that the signal frequency falls within the acquisition bandwidth of the carrier recovery loop.

However, Schemmann et al. discloses in section 0049 carrier lock (acquisition) using a phase locked loop. Schemman et al. further discloses (section 0067) when the phase locked loop is not locked to the carrier frequency (the phase locked loop bandwidth being offset from the carrier frequency bandwidth) performing a frequency sweep remove the offset between the phased locked loop (acquisition) bandwidth and the carrier (QAM) signal bandwidth. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the state machine of de Lantremange and Zhu et al. with the frequency sweep operation of Schemmann et al. in since Schemmann et al. states that the frequency sweep frequency "locks" the carrier loop (PLL) to the QAM (carrier) signal to allow the removal of frequency variations in the signal (section 0067).

10. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over de Lantremange (U. S. Patent No. 6, 115, 433) in view of Zhu et al. (US 2004/0005022) and in further view of McBurney (U. S. Patent No. 6, 150, 978).

Regarding claim 25, de Lantremange and Zhu et al. disclose the state machine is reset is state "0" (see Table 2, STATE 0), but fail to disclose re-acquiring a lost QAM signal while the state machine stays in state "0".

However, McBurney discloses re-acquiring a GPS signal which is lost due to obstruction of the signal (column 1, lines 16-28), wherein the GPS can be a QAM signal (column 2, line 65-column 3, line 10). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the state machine of de Lantremange and Zhu et al. with re-acquisition of a lost signal as taught by McBurney since McBurney states the lost signal should be reacquired as quickly as possible so that the least operational time in the device is lost (column 1, lines 26-29).

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom
May 4, 2006

Khanh cong Tran 05/9/2006
Primary Examiner ~~KHANH~~ TRAN